Claims

[c1] *1* .A detector, comprising:

a filter for substantially blocking photons having wavelengths of greater than about 250 nm;

a photodiode having a low dark current, a current from the photodiode being proportional to a quantity of photons having wavelengths of less than or equal to about 250 nm, which pass through the filter and impinge the photodiode; and,

a processor for determining the quantity of photons impinging the photodiode as a function of the current.

[c2] *2* .The detector as set forth in claim *1* , wherein the photodiode has a bandgap of greater than or equal to about 2.7 eV.

[c3] *3* .The detector as set forth in claim *2* , wherein the photodiode is an SiC photodiode.

[c4] *4* .The detector as set forth in claim *1* , wherein:

the filter provides a rise characterized as from less than about 50% reflectance to more than about 97% reflectance within a range of less than about 3 wavelengths; and,

the filter provides a cutoff characterized as from greater than about 99% reflectance to less than about 50% reflectance within a range of less than about 25 wavelengths.

[c5] *5* .The detector as set forth in claim *4* , wherein the filter is a Rugate filter.

[c6] *6* .The detector as set forth in claim *1* , wherein the filter includes:

inorganic material not degraded by temperatures greater than or equal to about 175 ° C.

[c7] *7* .The detector as set forth in claim *6* , wherein the inorganic material includes SiO_2 and Si_3N_4 or SiO_2 and HfO_2 or any other material pair with a discrete refractive index difference and being transparent in the wavelength region of interest.

[c8] *8* .The detector as set forth in claim *1* , wherein the photons include photons from a combustion event.

[c9] *9* .The detector as set forth in claim *8* , wherein the combustion event is a missile plume.

[c10] *10* .The detector as set forth in claim *1* , further including:
a signal conditioner for transforming the current from the photodiode into a signal transmitted to the processor, the processor determining the quantity of photons impinging the photodiode as a function of the signal.

[c11] *11* .The detector as set forth in claim *10* , wherein the current from the photodiode is analog and the signal transmitted to the processor is digital, the signal conditioner including:
an amplifier for amplifying the analog current; and,
an analog-to-digital converter for converting the analog current to the digital signal.

[c12] *12* .A method for detecting UV photons having wavelengths of less than about 250 nm, the method comprising:
filtering a plurality of UV photons to substantially block the UV photons having wavelengths greater than about 250 nm, the UV photons having wavelengths less than or equal to about 250 nm passing through the filter and impinging a photodiode which has a low dark current less than about 0.4 pA/cm^2 ;
generating a current from the photodiode, the current being proportional to a quantity of photons impinging the photodiode; and,
determining the quantity of photons impinging the photodiode as a function of the current.

[c13] *13* .The method for detecting photons as set forth in claim *12* , wherein the filtering step includes:
providing a rise characterized as from less than about 50% reflectance to more than about 97% reflectance within a range of less than about 3 wavelengths; and,
providing a cutoff characterized as from greater than about 99% reflectance to less than about 50% reflectance within a range of less than about 25 wavelengths.

[c14] *14* .The method for detecting photons as set forth in claim *12* , wherein the current is an analog signal, further including:
transforming the analog current from the photodiode into a digital signal

transmitted to a processor, the processor determining the of quantity of photons impinging the photodiode as a function of the digital signal.

[c15] *15*.The method for detecting photons as set forth in claim *14*, wherein the transforming step includes:
amplifying the analog current; and,
converting the analog current to the digital signal.

[c16] *16*.The method for detecting photons as set forth in claim *12*, further including:
detecting the plurality of photons that are included within a missile plume.

[c17] *17*.A system for detecting an object emitting ultraviolet radiation within an environment including solar ultraviolet photons, comprising:
a filter for substantially blocking solar ultraviolet photons;
an SiC photodiode, a current from the photodiode being proportional to a quantity of non-solar ultraviolet photons which pass through the filter and impinge the photodiode; and,
a processor for determining the quantity of the non-solar photons impinging the photodiode as a function of the current, determining whether the object is present as a function of the quantity of the non-solar photons.

[c18] *18*.The system for detecting an object as set forth in claim *17*, wherein:
the filter provides a rise characterized as from less than about 50% reflectance to more than about 97% reflectance within a range of less than about 3 wavelengths; and,
the filter provides a cutoff characterized as from greater than about 99% reflectance to less than about 50% reflectance within a range of less than about 25 wavelengths.

[c19] *19*.The system for detecting an object as set forth in claim *18*, wherein the filter includes:
inorganic material not degraded by temperatures greater than or equal to about 175 ° C.

[c20] *20*.The system for detecting an object set forth in claim *19*, wherein the inorganic material includes SiO_2 and Si_3N_4 or SiO_2 and HfO_2 or any other material pair with a discrete refractive index difference and being transparent in the wavelength